

A handheld GPS device with a yellow and grey casing. The screen displays a map with various colored lines and text. The device has several buttons and a small speaker at the bottom.

GeoExplorer CE Series

User Manual

Prepared by: Alexandre Marti

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GIS-MERI / NJMC

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Overview

This manual provides general information about the GeoExplorer CE (Geo-XT).

This manual is divided into three sections:

- **Introduction** explains how to use the Geo-XT by providing an overview of what the user can do with the TerraSync software .
- **Tutorial** provides step-by-step instructions for some of the tasks that the user can perform when using the software.
- **Advance Functions** explains how to create a Data Dictionary and configure the coordinate system or user defined settings.






Note: This manual has been developed according to the *NJDEP GPS Data Collection Standards for GIS Data Development*. In addition to the above sections, please review the Appendix of this manual for further details about these standards.

Additional Note: Each project must be delivered to the GIS Department with the corresponding NJMC GPS PROJECT FORM. Please ask for that form before going to the field.

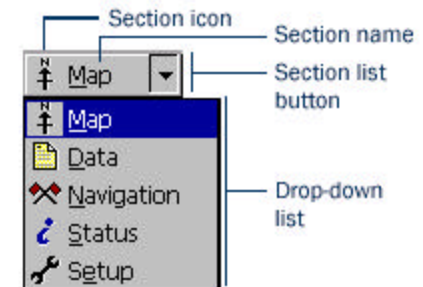
1. Introduction

The TerraSync software is used to set GPS parameters in the receiver, record GPS positions on the field, and update existing GIS data.

The TerraSync software is arranged in the following five sections:

-  Map section
-  Data section
-  Navigation section
-  Status section
-  Setup section

One of these sections is always active and visible. The Section list button shows the section that is currently active. You can move between sections at any time without closing any open forms or screens. To switch to a different section, tap the Section list button and then select the section you want from the drop-down list.



Note: The GPS Pathfinder Office software works with the TerraSync software which provides advanced mission planning and data dictionary creation. In addition, the software provides a way to transfer data from the unit (import and export). Lastly, Pathfinder post process data, such as differential correction.

The three sections that this manual will focus on, in order to create, process and update data are the **Data Section**, the **Map Section** and the **Setup Section**, which a user can utilize use to configure the unit according to a specific project.

1.1 DATA SECTION

Use the Data section to accurately collect the attributes and GPS position of geographic points, lines, and areas. This information is stored in one or more data files that you can transfer to Trimble's GPS Pathfinder Office software for postprocessing and editing.

1.2 MAP SECTION

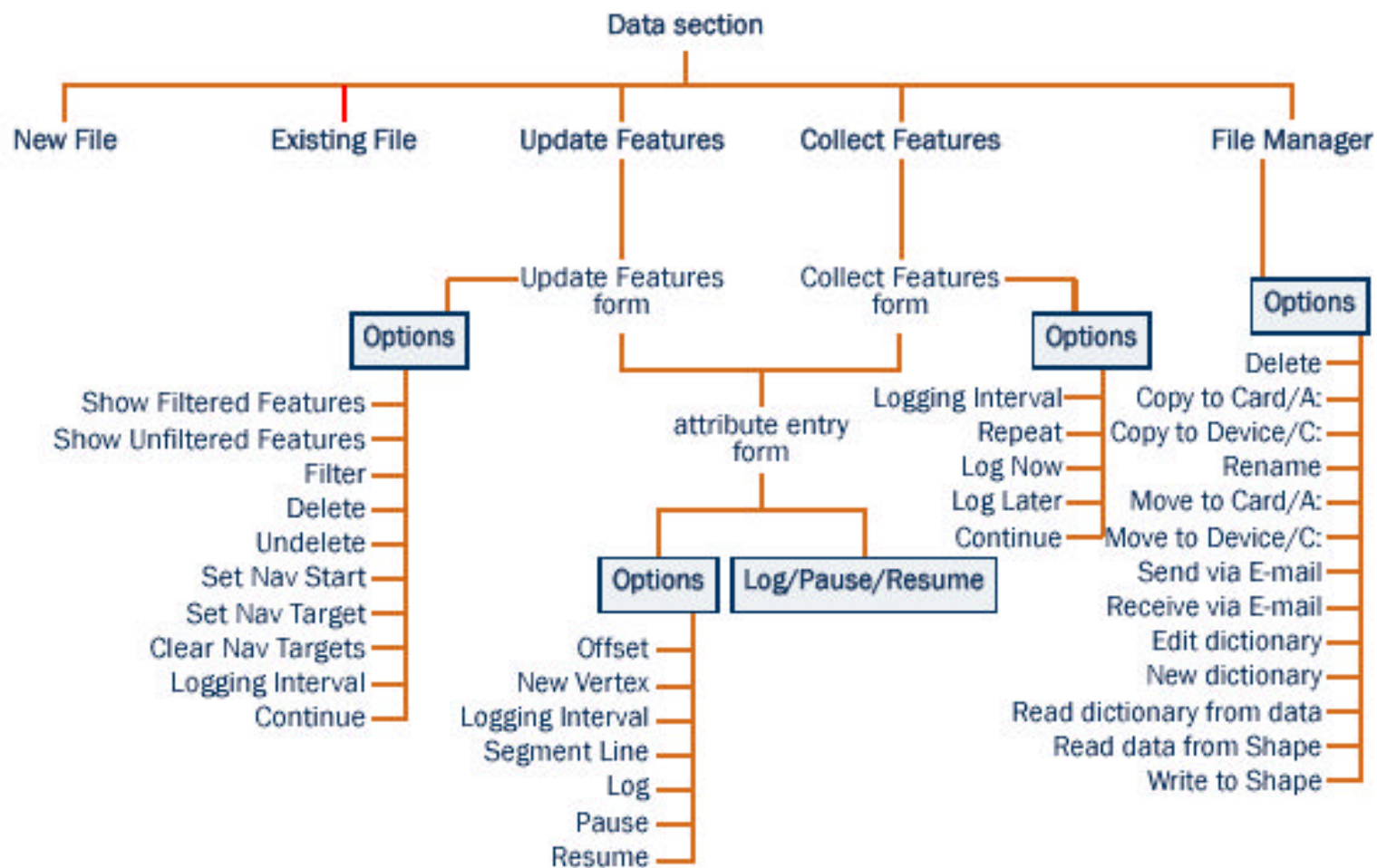
Use the Map section to show all the features in the open data file. A raster or vector map can be displayed in the background for reference.

1.3 SETUP SECTION

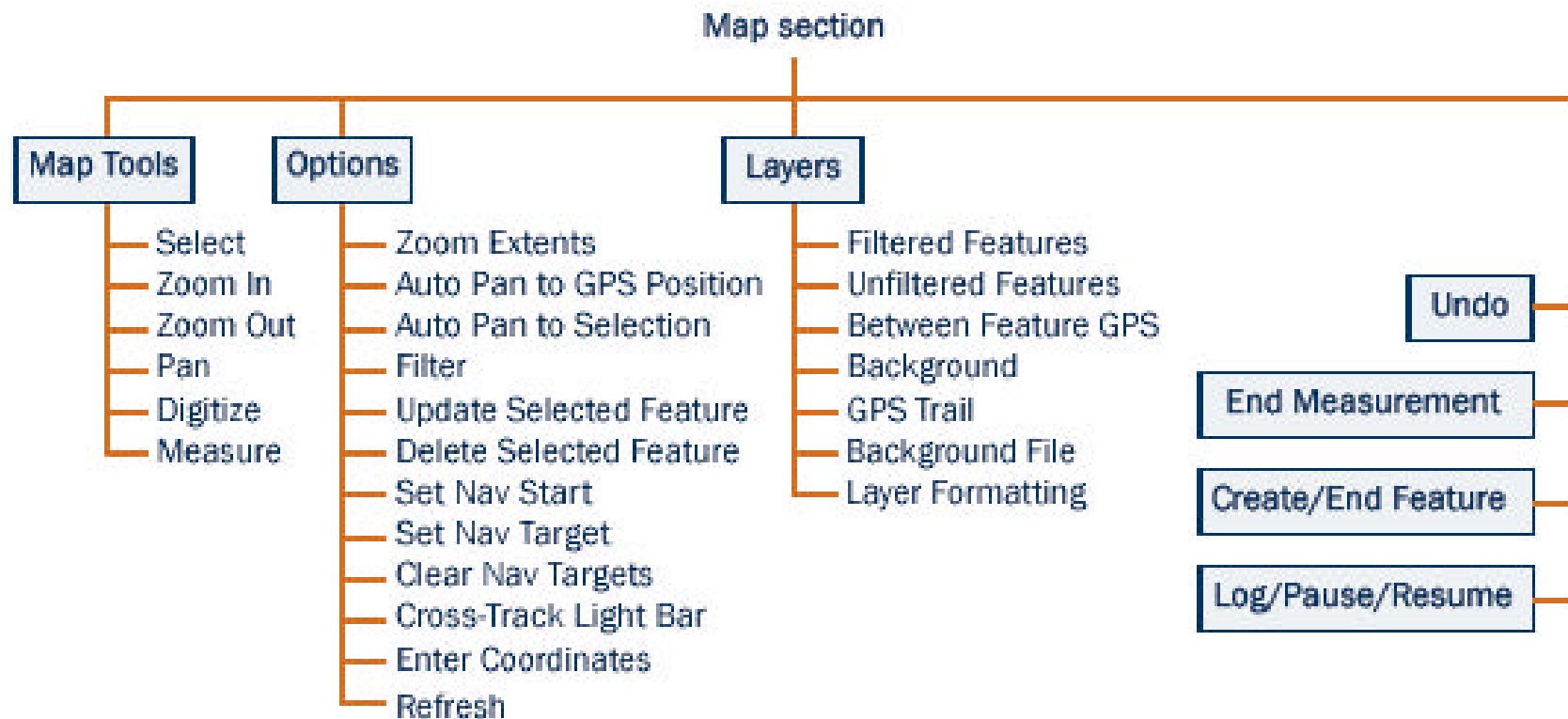
Use the Setup section to control how the TerraSync software interacts with the GPS receiver, to configure data collection and display settings.

Note: The next three diagrams outline the Data, Map and Setup sections and their structure. A user can use them as a handy reference until he becomes familiar with the sections and their subsections.

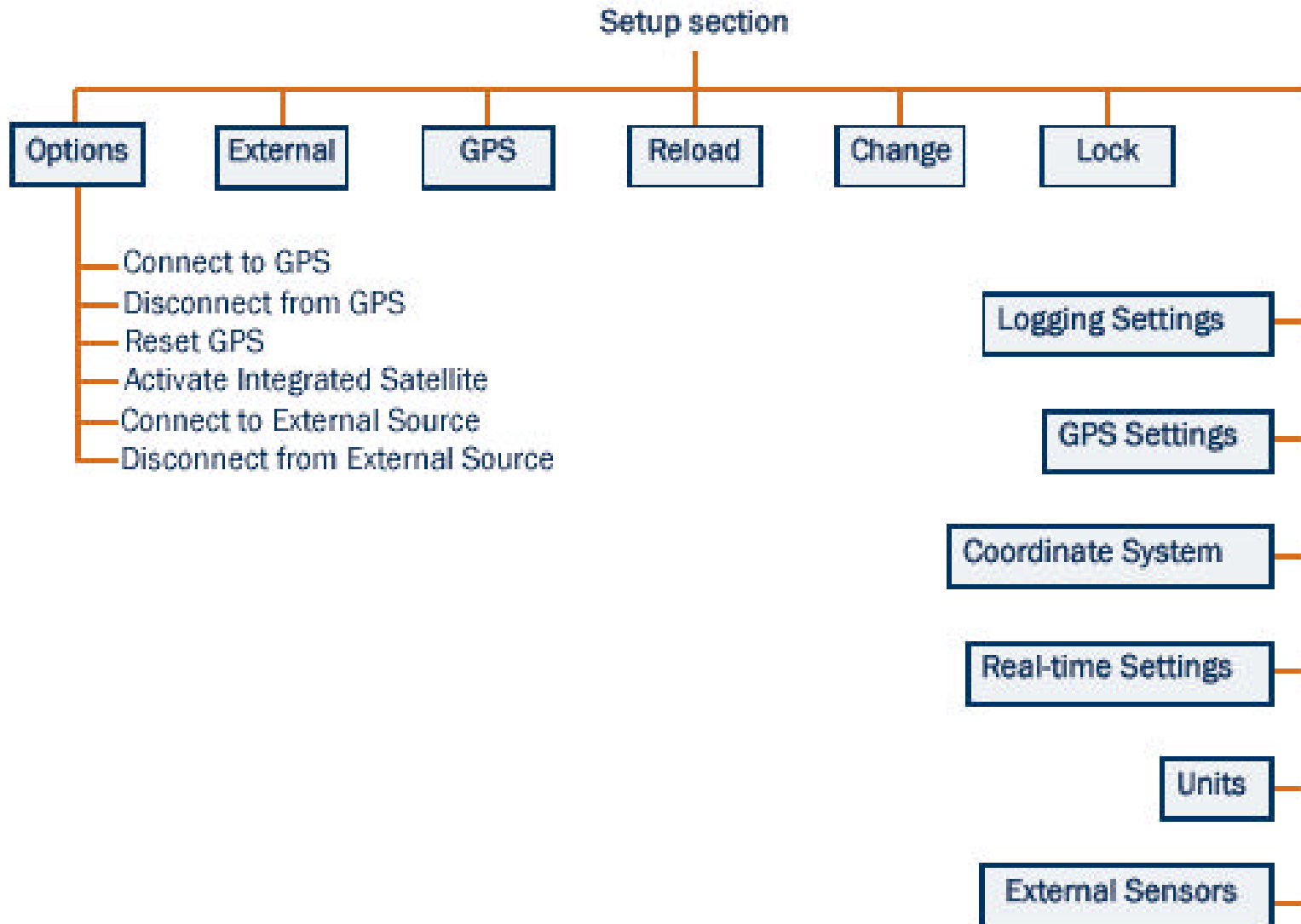
1.1 Data Section



1.2 Map Section



1.3 Setup Section



2. Tutorial

This tutorial will assist users in familiarizing with the main concepts and tasks involved in using the TerraSync software. The tutorial section is divided into four parts: three relate to data collection, and one relate to real-time data update.

Follow this step-by-step tutorial to collect, process and update data with the GeoXT Unit:

A. DATA COLLECTION

In this part of the tutorial a user will learn how to collect new features. First, a new project must be created and the equipment must be prepared for data collection. Once in the field, the user will be able to record new features and their attributes. Upon returning to the office, a user can postprocess the data to achieve better positional accuracy. At that point, a user can export the data in a SHP(Shapefile) format.

As discussed above, the sections explained include:

- 2.1 Preparing for data collection
- 2.2 Data collection
- 2.3 Processing the data

B. DATA UPDATE

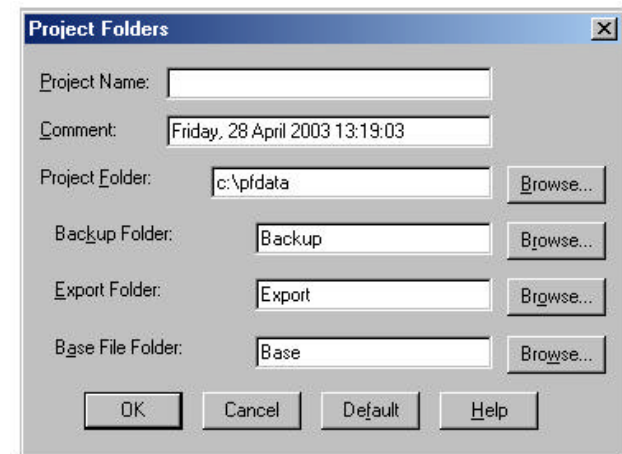
This part of the tutorial allows the user to update existing GPS data. Updating data in this manner (where time has passed since a user collected the features), will allow the user to go back and update their attributes.

- 2.4 Updating Data

2.1 Preparing for Data Collection

Before going to the field to collect data, a user need to perform these 3 steps:

1. **Create a new project in the GPS Pathfinder Office software.**
Open the GPS Pathfinder software and click on new project. In the project dialog box, select the paths where your data will be stored. Click OK again to close this dialog and create the new project.
2. **Create a Data Dictionary for the new project.** A data dictionary contains a description of the features and attributes relevant to a particular project. It is used in the field to control the collection of a feature and its attributes.
3. **Check your equipment** to make sure that you are ready to go out into the field. You need to make sure that:
 - the receiver batteries are charged (take a spare one)
 - the data dictionary is created properly
 - Additional/external devices such as field computers, antennas or connection cables are available

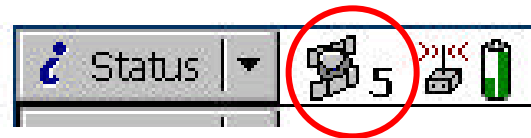


Project Dialog Box.

Once at the site, a user needs to review the following conditions:

4. **Check for Satellite Availability (on-site).** Before collecting any data you must check if there are enough satellites available to start collecting data. The speed and the quality of the data collected will depend on the number of satellites computed.

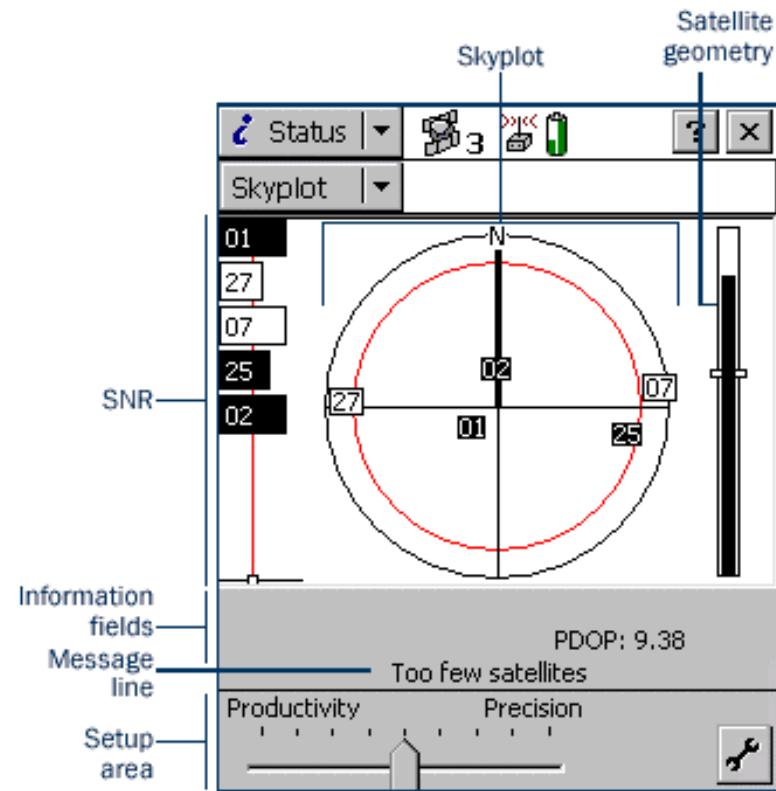
A. Check the Status of the Skyplot. When opening the Terrasync software the Skyplot screen in the Status section appears after the identification screen. It provides a graphical display of the satellites available to the receiver. Check for a minimum of *4 satellites before collecting data*.



For optional reading, is preferred a clear view of the sky. Satellite signals can be blocked by people, buildings, heavy tree cover, large vehicles, or powerful transmitters. Use the satellite icon on the Status bar to check whether the receiver is computing GPS positions. This icon provides information about the geometry of the satellites that are being used to compute GPS positions.

B. Check for the rest of the Components of the Skyplot screen. The Skyplot screen includes:

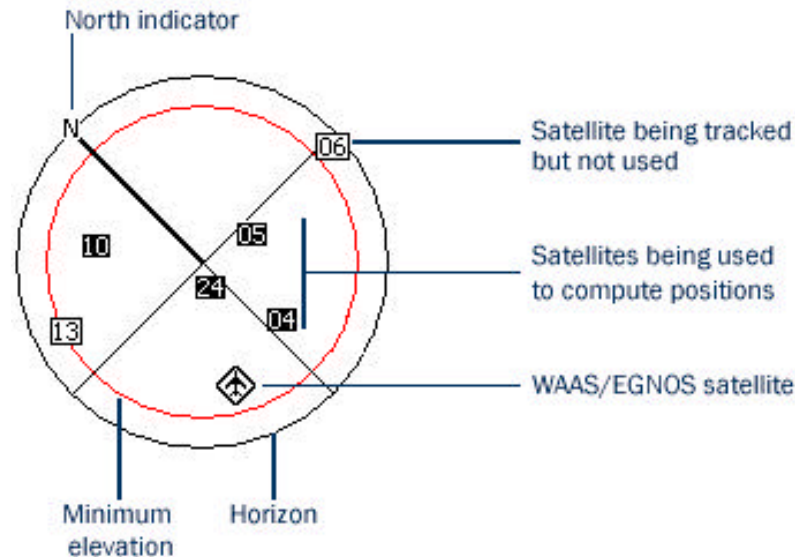
- Skyplot
- SNR graph
- Satellite geometry indicator



Other advanced info also appear at the bottom of the screen:

- Information fields
- Message line
- Setup area

- **Skyplot:** The black outer circle represents the horizon (at 0°). The inner circle, which is red on a color screen, represents the configured Min Elevation. When the minimum elevation value is changed, the inner circle of the skyplot changes diameter accordingly. If the minimum elevation is increased, the inner circle gets smaller and only those satellites higher in the sky are used to compute GPS positions



Satellites shown as filled black boxes are currently being used by the TerraSync software to compute GPS positions. Satellites shown as white boxes are being tracked, but are not being used to compute positions. Satellites shown without boxes are available, but are not being tracked. If a WAAS or EGNOS satellite is being tracked, its location is indicated by a plane icon. Check the PDOP and the HDOP to measure the quality of GPS positions based on the geometry of the satellites (write this number on the NJMC GPS PROJECT FORM)

TIP: Remember that you will need at least **4 satellites** to start collecting data. If there are no satellites computed, Move away from any possible obstructions.

- **SNR bar graph:** The SNR bar graph on the left of the Skyplot screen is a graphical representation of the signal quality of each satellite that the GPS receiver is currently tracking. A black bar represents a satellite with a signal strength above the configured minimum level. An empty bar represents a satellite that is not being used to compute GPS positions because its signal strength is below the configured minimum level. The vertical red line shows the configured minimum SNR value.



- **The satellite geometry indicator:** is a graphical representation of the overall quality of the GPS positions computed. The white horizontal bar shows the configured minimum quality value, and the level of black inside the indicator shows the current quality value.

The quality of the computed positions is a function of how the satellites are positioned in the sky relative to each other and you. When the satellites are well spaced, and cover a large portion of the sky, the GPS receiver can compute accurate positions and the level inside the indicator is high. If satellites are grouped together in the sky, the precision of the computed positions is reduced, and the level inside the indicator is low.



TIP: Remember that your position is important to get the maximum number of satellites. The skyplot rotates (like a compass) to indicate the direction that you are travelling in. Your direction is calculated from the last GPS positions received. If no positions have been received recently, the direction shown may not be correct.

2.2 Data Collection

This section explains the tasks and gives the step-by-step instructions required to collect point, line, and area features, with a variety of different attributes.

This part of the tutorial gives step-by-step instructions for the following tasks:

2.2.1 Creating a new data file

2.2.2 Collecting a point feature

2.2.3 Collecting a line feature with Log Later

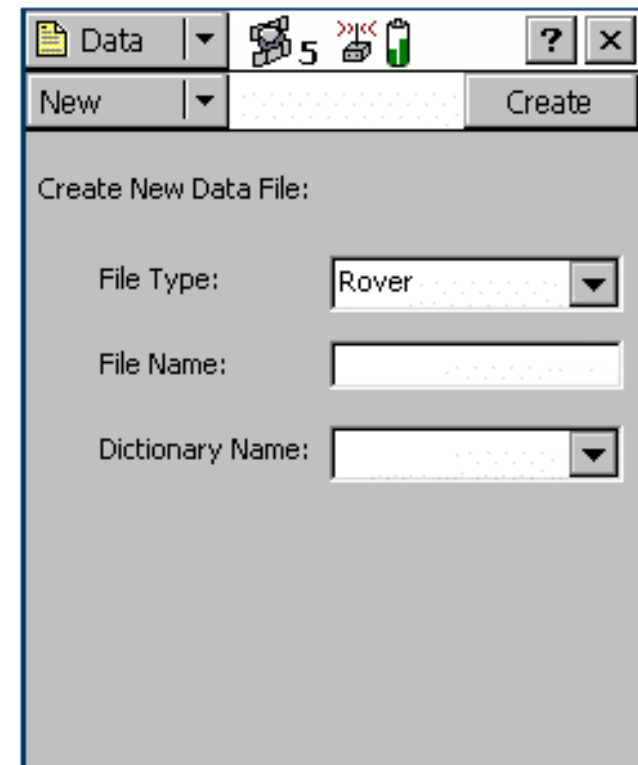
2.2.4 Collecting an area feature

2.2.5 Ending the data collection session

2.2.1 Creating a new data file

Before starting the data collection session, you need to create a new data file to store the new features and attributes you collect. Use the Data section to do this. To create a new file do the following:

1. Tap the Section list button, and then select Data.
2. Tap the Subsection list button, and then select New File. The New File screen appears.
3. The TerraSync software automatically enters a default name in the File Name field. Replace the default name with the Project Name → Department_NameOfSite
4. In the Dictionary Name field, make sure that the desired data dictionary is selected.
5. Tap Create.
6. The Confirm Antenna Height form appears. If necessary, enter the correct antenna height and measurement point, and then tap OK.
7. The Collect Features screen appears. This screen shows a list of all the features in the data dictionary.



The screenshot shows the 'Create New Data File' dialog box. At the top, there is a header bar with a 'Data' dropdown menu, a 'New' dropdown menu, and a 'Create' button. Below the header, the dialog box contains the following fields:

- File Type:** A dropdown menu with 'Rover' selected.
- File Name:** A text input field with a dotted pattern.
- Dictionary Name:** A dropdown menu with a dotted pattern.

You have created a new data file, so you can now start collecting features.

2.2.2 Collecting a point feature

To record a point feature, the user must remain stationary while the TerraSync software logs GPS positions. These positions are averaged to compute the final GPS position of the point feature. When the TerraSync software is logging GPS positions, the logging icon appears in the status bar. The number beside the icon indicates how many positions have been logged for the feature being collected (GPS's).

1. Make sure that the Collect Features screen is open. If it is not, tap the Section list button, select Data, and then tap the Subsection list button and select Collect Features.
2. In the Choose Feature list, highlight the Point Feature that you want to collect.
3. Tap Create. The Feature attribute entry form appears.
4. Fill the attributes for that feature with the proper information.
5. As the software logs GPS positions, the counter beside the logging icon increments. When you have finished entering the attributes, tap OK to close the road sign feature. The attribute entry form closes and you are returned to the Collect Features screen.
6. Later in the tutorial, you will navigate back to a point that needs to be replaced, and update its attributes. Repeat the above procedure to log another point feature. When you get to step 5, change the Condition field to Replace.

The screenshot displays the 'Point feature' attribute entry form within the TerraSync software. The interface includes a top status bar with icons for Data, a counter (5), a logging icon, a battery level indicator, and a question mark. Below the status bar, there are buttons for 'Collect', 'Options', and 'Pause'. The main form area contains a 'Point feature' label, an 'OK' button with a red square icon, and a 'Cancel' button. Below these are three dropdown menus labeled 'Date Visited:', 'Type:', and 'Condition:'. The 'Date Visited:' dropdown is currently empty, while the 'Type:' and 'Condition:' dropdowns show a list of options, though the specific options are not clearly visible.

2.2.3 Collecting a line feature with Log later

To record a line feature, you need to travel along the line. As you do so, the TerraSync software will record a GPS position at the configured logging interval, which defaults to the value that was set when the feature was created in the data dictionary. These positions are joined together to form a line. By default, the TerraSync software begins logging GPS positions as soon as you open a new feature. You can use the Log Later option to delay logging of positions until you have entered the attributes for the feature, or until you reach the start of the feature. To record a line feature with the Log Later option:

1. Make sure that the Collect Features screen is open. If it is not, tap the Section list button, select Data, and then tap the Subsection list button and select Collect Features.
2. In the Choose Feature list, highlight the Line Feature that you want to collect.
3. Tap Options and select Log Later.
4. Tap Create. The Feature attribute entry form appears.
5. Fill the attributes for that feature with the proper information.
6. Move to the start of the line feature and tap Log to begin logging GPS positions for the feature. The pause icon disappears from the status bar and the number on the logging icon increments as each position is recorded.
7. Continue down the line feature. When you reach the end of the line you are logging, tap OK to close the road feature.

The screenshot displays the TerraSync software interface. At the top, there is a status bar with icons for Data, a collection icon with the number 5, a battery level indicator, a signal strength indicator, and a help icon. Below the status bar, there is a 'Collect' dropdown menu, an 'Options' dropdown menu, and a 'Pause' button. The main form is titled 'Line Feature' and has a red square icon next to it. It contains two input fields: 'Name:' and 'Number of Lanes:'. The 'Name:' field is currently empty, and the 'Number of Lanes:' field is also empty. There are 'OK' and 'Cancel' buttons at the bottom of the form.

2.2.4 Collecting an area feature

To record an area feature, you need to travel around the perimeter of the area. As you do so, the TerraSync software will log GPS positions at the logging interval set in the data dictionary. These positions are joined together to form the perimeter of the area. The first and last GPS positions are joined together to close the area, so there is no need to return to the exact start point.

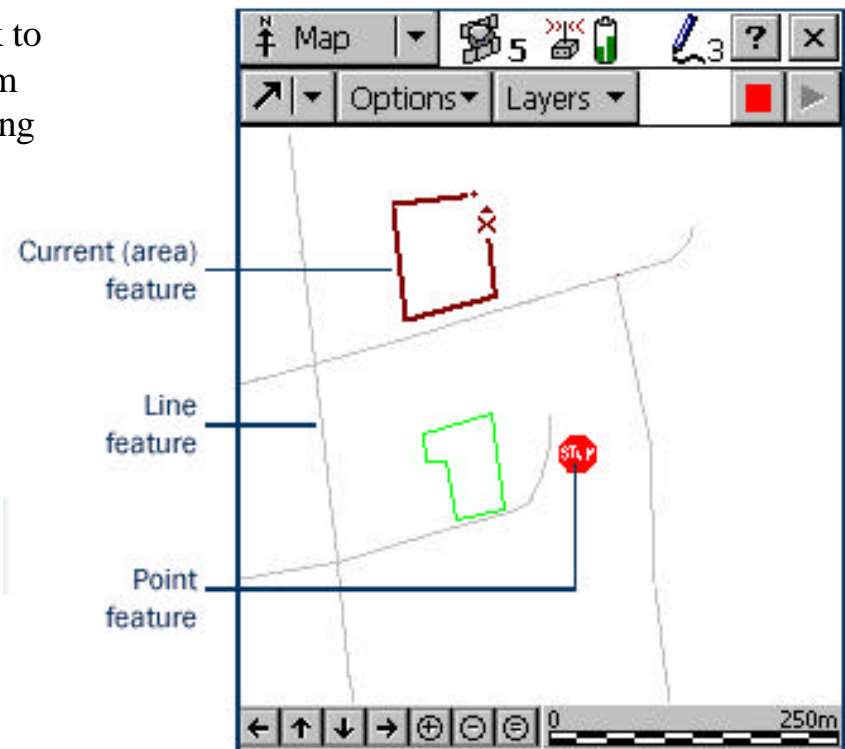
When you logged the line feature, you recorded the attributes before you started to log GPS positions. For the area feature, you will log GPS positions at the same time as you record the attributes.

1. Make sure that the Collect Features screen is open. If it is not, tap the Section list button, select Data, and then tap the Subsection list button and select Collect Features.
2. Tap Options and select Log Now.
3. Fill the attributes for that feature with the proper information.
4. Tap Create. The attribute entry form for the area feature opens, and the TerraSync software starts to log positions.
5. To pause logging, tap Pause. The TerraSync software stops logging positions and a pause icon flashes in the status bar. To continue collecting the area feature, tap Resume to resume logging. The pause icon disappears.

You can also pause logging if you want some time to enter attribute values.

The screenshot shows the TerraSync software interface. At the top, there is a status bar with icons for Data, a list of sections (5), a battery level indicator, and a question mark. Below the status bar, there is a 'Collect' dropdown menu, an 'Options' button, and a 'Pause' button. The main screen is titled 'Area feature' and has a red square icon next to it. Below the title, there are two buttons: 'OK' and 'Cancel'. The 'Name:' field is empty. Below the 'Name:' field, there is a 'Number of Lanes:' label and an empty input field.

6. You can view the map while collecting features. To do this, tap the Section list button and select Map. The features that you have collected are displayed on the map, along with the feature perimeter that you are currently collecting. You can view the map at different scales. To do this, tap the Zoom In or Zoom Out button on the Command bar. Alternatively, tap the Map Tools list button, select Zoom In or Zoom Out, and then select the point on the map that you want to zoom in or out from.
7. Tap the Section list button and select Data to go back to the Data section. The Area feature attribute entry form is still active and the TerraSync software is still logging positions for the feature.
8. Enter the feature's attributes.
9. When you have walked around the perimeter of the area, tap OK to close the feature.



2.2.5 Ending the data collection section

When the data collection session is complete, close the data file and exit the TerraSync software.

To close the open data file and exit the TerraSync software:

1. Tap Close in the Collect Features screen. A message appears, asking you to confirm that you want to close the open file.
2. Tap Yes to close the current data file and return to the New File screen.
3. Tap the Close button in the upper right corner of the screen. A message appears, asking you to confirm that you want to exit the TerraSync software.
4. Tap Yes to exit the TerraSync software.

2.3 Processing the data

After the data collection session, use the GPS Pathfinder Office software to process the data collected, and to transfer the data to the GIS, or other format.

This part of the tutorial shows you how to transfer and view the data. The topics discussed are:

2.3.1 Transferring data to the office computer

2.3.2 Differentially correcting data

2.3.3 Viewing data

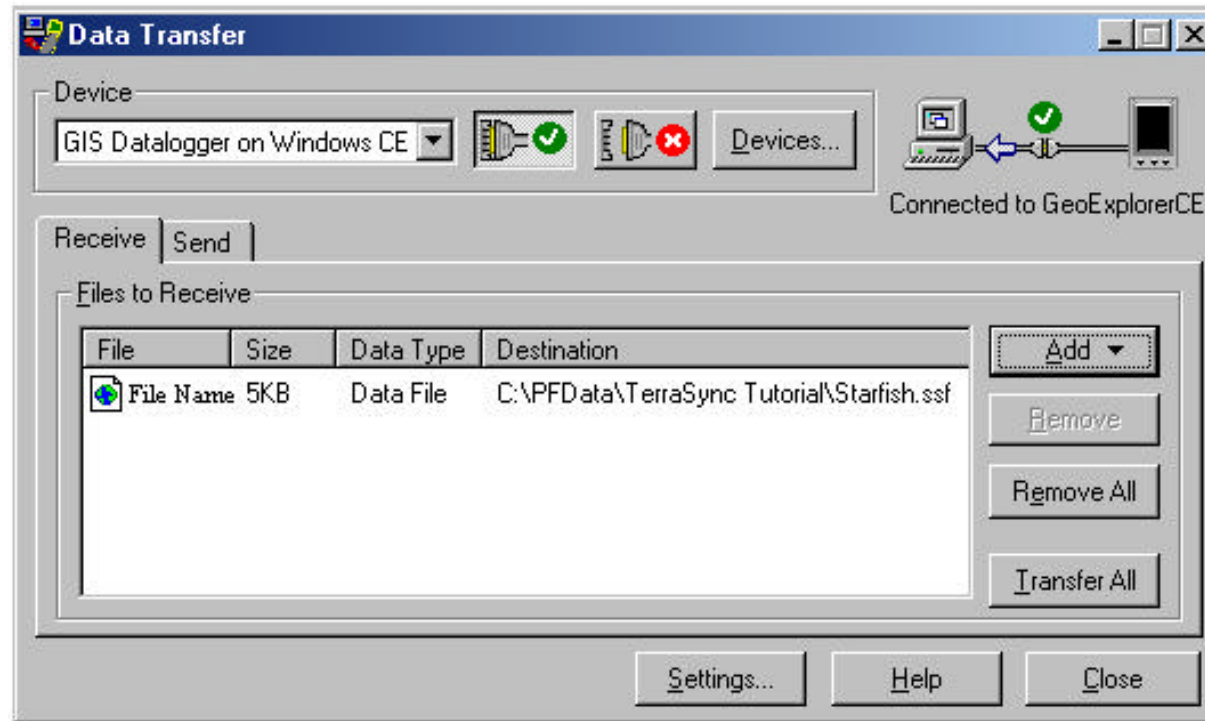
2.3.4 Exporting data to a GIS

2.3.1 Transferring Data to an office computer

You need to transfer the data you collected in the field from the GPS unit to the office computer. To transfer the data file from the GPS unit to the office computer:

1. Switch on the unit and the office computer and connect the two computers. When ActiveSync is connected to a CE device, the message Connected appears in the main ActiveSync window, and the ActiveSync icon in the taskbar is green.
2. In the GPS Pathfinder Office software, select Utilities / Data Transfer. The Data Transfer dialog appears.
3. From the Device list, select the appropriate device (GIS Datalogger on Windows CE). Alternatively, if you have set up a device definition for the GPS unit, select that device name from the list. The Trimble Data Transfer utility automatically connects to the field computer.
4. Click Add and select Data File from the drop-down list. The Open dialog appears.
5. Check that the Destination field shows C:\Pfddata\TerraSync Tutorial, then click Open. The Open dialog disappears and the file appears in the Files to Receive list.

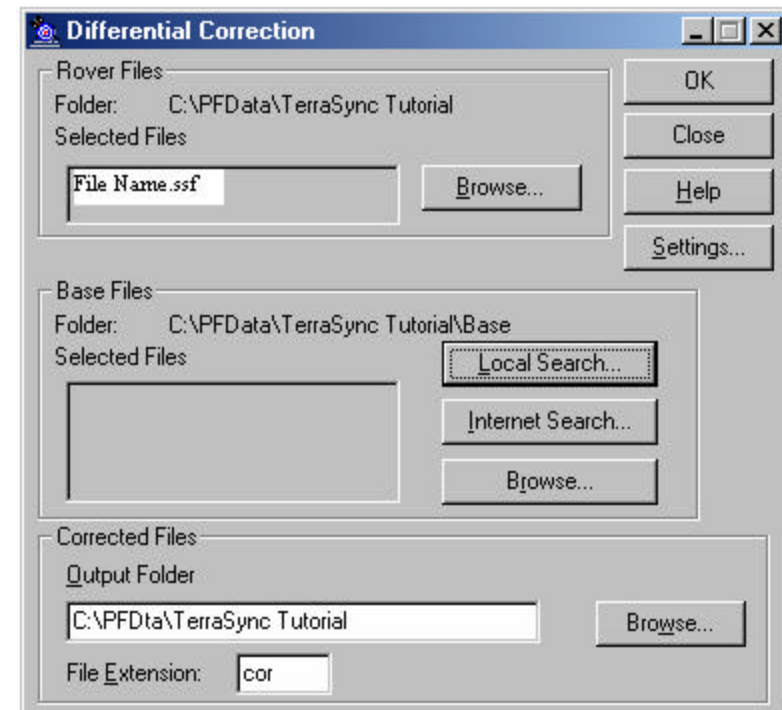
6. Click Transfer All. The data file is transferred to the desktop computer.
7. A message box showing summary information about the transfer appears. Click Close to close it.
8. Click Close to close the Data Transfer utility.



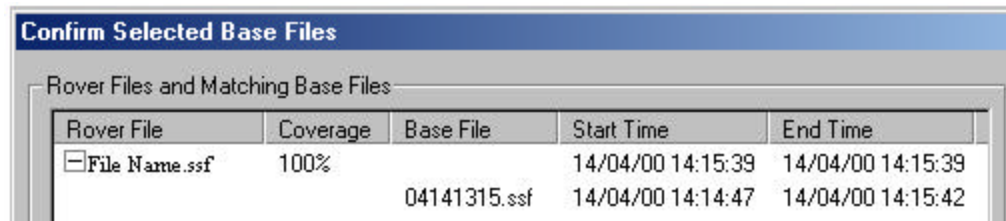
2.3.2 Differentially correcting data

The data collected by GPS receivers is subject to errors, including small satellite clock errors, orbit errors, atmospheric noise, and multipath errors. The vast majority of these errors can be removed from the data by differential correction. Differential correction improves the accuracy of GPS positions to the specified accuracy of the receiver. To differentially correct the data file do the following:

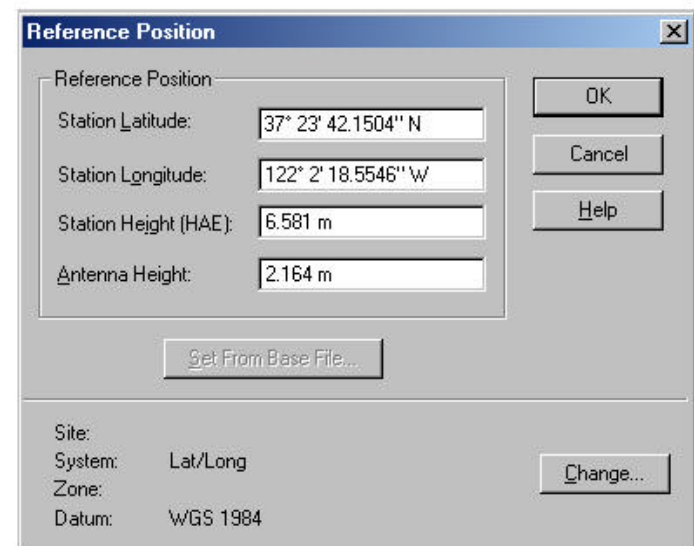
1. Start the GPS Pathfinder Office software and open the TerraSync Tutorial project (or project that you worked on).
2. Select Utilities / Differential Correction to start the Differential Correction utility. The Differential Correction dialog appears.
3. The file you transferred from the CE device should appear in the Selected Files field. If it does not appear, click Browse and locate the file called *FieldName.ssf*, and then click Open.



4. Specify the location of the base files. Depending on the source of the base files, there are three options: Local Search for base files, Internet Search for base files, or Browse. By default, base files are stored in the current project's base file folder on your local drive. If you need to change the Folder path for the Local Search for base files option, click Browse. The Confirm Selected Base Files dialog appears.

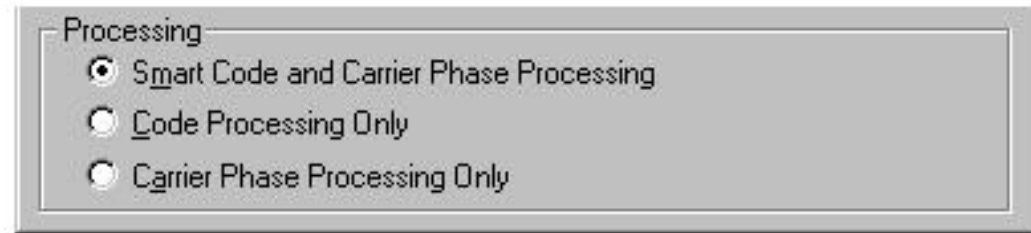


5. Use the Confirm Selected Base Files dialog to make sure that the selected base files provide coverage for the rover files. Click OK. The Reference Position dialog appears.



6. Click OK to confirm the reference position.
7. Specify the output folder. By default, the output folder is the current project folder.

8. Select a processing option. By default, Smart Code and Carrier Phase Processing is selected.

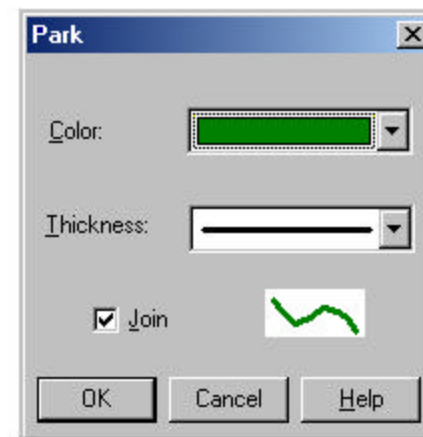
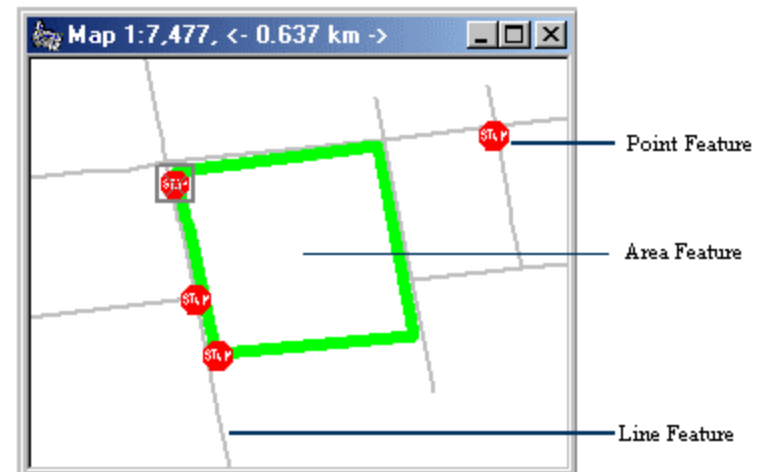


9. Click OK to differentially correct the selected files.
10. The Differential Correction Completed dialog details the results of the differential correction. Click Close to close this dialog.

2.3.3 Viewing data

When the data has been transferred and differentially corrected you can display, edit, and plot it using the GPS Pathfinder Office software. The GPS Pathfinder Office Map window is the best way to view field data and to verify its integrity. Use it to make graphical queries and measurements on the collected data. You can specify the colors, symbols, and line styles for each feature. To view the data:

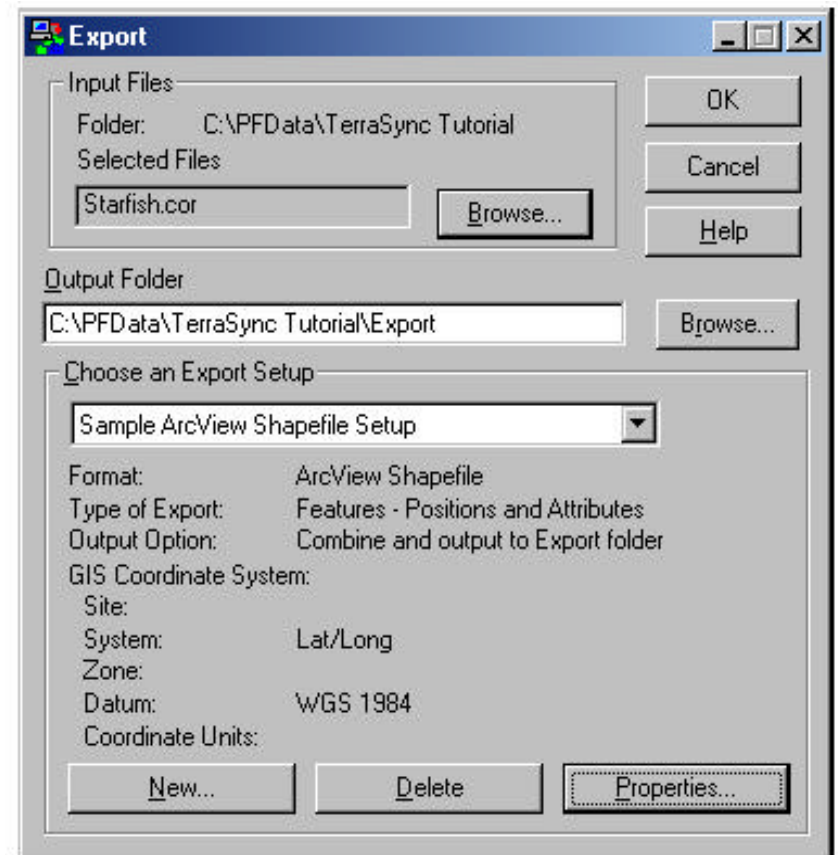
1. In the GPS Pathfinder Office software, select File / Open.
2. Select the FileName.cor file. FileName.cor is the differentially corrected version of the file FileName.ssf, which you transferred from the GPS unit.
3. If the Map window is not visible, select View / Map.
4. The Map window displays the selected file.
5. To display the attributes of any feature on the map, double-click the feature.
6. The Feature Properties dialog appears. It provides attribute information about the selected feature.



2.3.4 Exporting data to GIS

The Export utility in the GPS Pathfinder Office software converts files that are in SSF format into a format that can be read by a GIS, CAD, or database system. It lets you export point, line, and area features, attributes, and positions to a variety of other formats. To export data to a GIS:

1. In the GPS Pathfinder Office software, start the Export utility by selecting Utilities / Export.
2. Click Browse to display the Open dialog. Browse for FielName.cor, highlight it, and click Open.
3. Select the output folder. By default, this is the export folder in the current project.
4. In the Choose an Export Setup group, select Sample ArcView Shapefile Setup.
5. Make sure that the GIS Coordinate System group shows the Latitude/Longitude coordinate system. If the coordinate system is incorrect, click Properties, then select the Coordinate System tab in the Export Properties dialog to change the coordinate system.
6. Click OK to export the selected file(s) using the specified export setup.
7. The Export Completed dialog details the results of the export. Click Close to close this dialog.
8. You can now open it in a GIS Program.



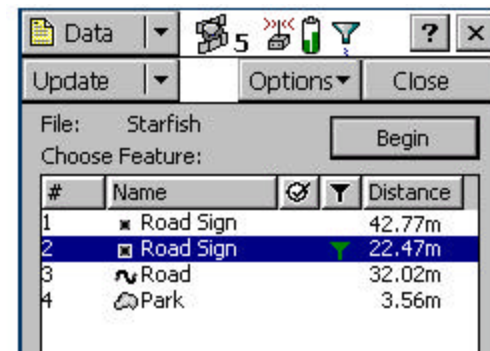
2.4 Updating data

This part of the tutorial gives step-by-step instructions for the following tasks:

1. Tap the Section list button and select Data.
2. Tap the Subsection list button and select the File that you want to update and tap Open.
3. In the Data section, open the Update Features screen. Tap the Subsection list button and choose Update Features.
4. Tap Options and select Filter. The Filter By form appears. Make sure that the Features check box is selected and perform your Filtration.
5. In the Update Features screen, highlight the filtered feature and Tap Options.
6. Select Set Nav Target. The target icon appears beside the selected feature. 🎯 This icon replaces the point

You have opened the existing file and navigated to the feature. Now you can edit the attributes.

1. Tap the Section list button and select Data, then tap the Subsection list button and select Update Features.
2. Tap Begin. The attribute entry form for this feature will display.
3. Use this form to update the attributes for the point feature.



TIP — In the Update Features screen, the Updated column of the Choose Feature list shows the update status of each feature. Any feature that has been transferred from the GPS Pathfinder Office software has an empty circle in this column. When a transferred feature is updated, a checkmark appears in the circle.



3. Advance Functions

When using the GeoXT Unit to collect and update data, you can take advantage of a variety of advanced functions to provide more accurate and efficient results. The following topics are discussed here:

3.1 Creating a Data Dictionary

3.2 Configuring Coordinate Systems

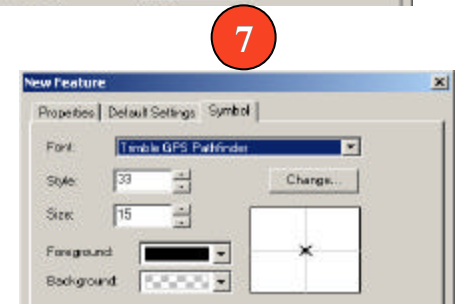
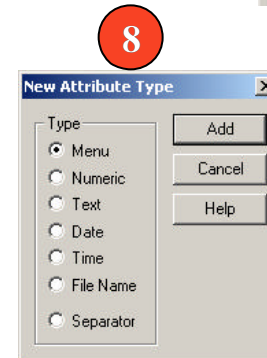
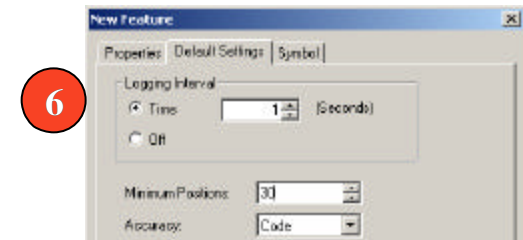
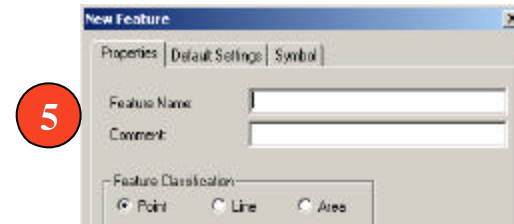
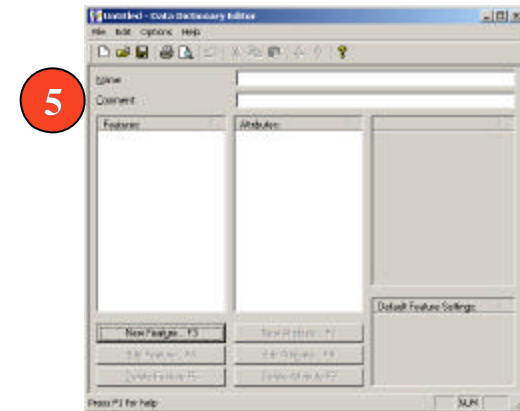
3.3 Configuring Logon settings

3.4 Choosing and Updating the Almanac

3.1 Creating a data dictionary

When you select the New Dictionary Editor from the Utility tab, the New dictionary form appears. Use this form to specify a name for the new data dictionary. When you have entered a name, use that form to add features and attributes to the data dictionary.

1. In the GPS Pathfinder Office software, select Utility / Data Dictionary Editor.
2. Select the Name of the Data Dictionary and write a brief description on the comments field.
3. Click on the New Feature tab (or press F3) to add a feature.
4. Write the name of the new feature and describe it on the comments field.
5. Select the feature classification as: Point, Line or Area.
6. Click on the default settings tab and select the Logging Interval Time as 1 seg and define 30 as the minimum positions amount.
7. Under the symbol tab, select the style of symbol as its size and color. You can use foregrounds and backgrounds for areas.
8. Add the type of attributes related to the feature by clicking the add attribute tab. Once you are done with this feature you can create another feature and add its attributes in the same way.
9. Save the Data Dictionary and close the dialog box.



3.2 Configuring coordinate systems

You can use the Coordinate System form to edit the coordinate system, zone, and datum parameters. The TerraSync software lets you specify a datum transformation and a map projection so that you can see your GPS position, and the position of features you collect, in your local coordinate system. This makes it easy for you to check your position or to navigate using a map produced by your GIS.

1. Open the Setup section. Tap the Section button and select Setup from the drop-down list.
2. Tap Coordinate System. The Coordinate System form appears
3. Use this form to specify the coordinate system, site, zone, datum, and altitude reference. You can also specify the units used to display the coordinates and altitude.
4. Tap OK when you have finished.
5. The Coordinate System form closes and any changes you have made are applied immediately throughout the TerraSync software. If any points in the Map section are not within the coordinate system you select, TerraSync warns you and asks you to confirm that you want to apply the new coordinate system. If you do, the map points that are outside this system are not displayed on the map.

The Coordinate System form closes and any changes you have made are applied immediately throughout the TerraSync software. If any points in the Map section are not within the coordinate system you select, TerraSync warns you and asks you to confirm that you want to apply the new coordinate system. If you do, the map points that are outside this system are not displayed on the map.

According with the NJDEP GPS Data Collection Standards For GIS and according to the coordinate system used for the New Jersey Meadowlands Commission, select the following options :

Coordinate System

Select By:
Coordinate System and Zone

System:
[Dropdown]

Zone:
[Dropdown]

Datum:
[Dropdown]

Altitude Reference:
Height Above Ellipsoid (HAE) [Dropdown]

OK Cancel

- ☐ **System:** US State Plane 1983
- ☐ **Zone:** New Jersey 2900
- ☐ **Datum:** NAD83 (Conus)
- ☐ **Altitude Reference:** Height Above Ellipsoid (HAE)
- ☐ **Altitude Units:** US Survey Feet
- ☐ **Coordinate Units:** US Survey Feet
- ☐ **Display USNG:** Off

3.3 Configuring Login settings

To open the Logging Settings form, tap Logging Settings in the Setup screen. Use this form to configure settings that control what data is stored, and how.

Setup | ▼

Logging Settings OK Cancel

Log Velocity Data: No ▼

Log SuperCorrect Data: Yes ▼

Log QA/QC Data: No ▼

Antenna Height: 2.000 m ⚙️

Allow Position Update: Confirm ▼

Confirm End Feature: No ▼

- ☐ **Log Velocity Data:** No
- ☐ **Log SuperCorrect Data:** Yes
- ☐ **Log QA/QC Data:** No
- ☐ **Antenna Height:** 3.501 ft
- ☐ **Allow Position Update:** Confirm
- ☐ **Confirm End Feature:** No
- ☐ **Field Name Prefix:** Your choice (R by default)
- ☐ **Between Feature Logging**
 - **Style :** Time
 - **Interval:** Off
- ☐ **Point – Line or Area Generic:**
 - **Interval:** 1s
 - **Accuracy:** Code

Appendix - NJDEP GPS Data Collection Standards For GIS

In accordance with the NJDEP GPS Data Collection Standards for GIS, the NJMC mapping grade GPS receivers used must adhere to the following requirements:

- ☐ The GPS receiver must routinely achieve 5 meter or better horizontal, 95% confidence level, using either in real time or post processed differential corrections since the unit used at the NJMC is considered under the NJDEP GPS receivers classification as a: mapping or resource grade, code based receivers
- ☐ The GPS receiver must operate in a 3D mode, where the receiver requires signals from a minimum of four satellites to determine a 3D (latitude, longitude, and elevation) location (a fix).
- ☐ The GPS receiver must allow the storage of position fixes for features that are being mapped. When mapping point features, the receiver must be able to store a sample of position fixes (a minimum number **30** positions) for the feature. The receiver must have enough data storage capacity for a typical day's worth of data collection.
- ☐ GPS receivers must have five or more channels for tracking satellites.
- ☐ Intervals for point features will be 1 or 5 seconds. Intervals for line and area features depend on the velocity at which the receiver will be traveling and the nature of the feature and the operating environment. Under normal circumstances (i.e., when the user is walking with the receiver) the interval for line and area features will be set to 5 seconds.
- ☐ The GPS processing software must allow for exporting to either ArcInfo generate format or ArcView shapefile.
- ☐ Coordinate data must be in the New Jersey State Plane Coordinate System (NJSPCS) in the North American Datum of 1983 (NAD83) horizontal geodetic datum. The preferred unit of measure is the US Survey Foot, though meters is also acceptable. Typically feature coordinate data and field entered attribute data will export to separate files.

- ❑ If elevation data is required by the project, it will be referenced to the North American Vertical Datum of 1988 (NAVD 88) vertical geodetic datum. Elevations must be generated as orthometric heights (relative to mean sea level) determined using the GEOID99 (Continental US) geoid conversion model. Conversions from other geoid conversion models are not acceptable.

Final deliverables to NJMC will include the following GPS and GIS files:

1. All GPS to GIS export files (using New Jersey State Plane Coordinates, in the NAD 83 horizontal geodetic datum, in US survey feet units).
2. All GPS processing log files pertaining to post process differential correction and GIS export (if produced by the GPS processing software).\
3. GPS Data dictionary files, defined for project attribute storage.
4. GIS coverage files (ArcView shapefiles, ArcInfo coverages, Arc export files, etc.)

In order to have a complete and accurate record of the data collected by the GeoXT Unit the NJMC GPS project Form must be filled. That will help for the creation of future Metadata and for tracking purposes.

Generated Attributes

All Features	Point Features	Line and Area Features
Maximum PDOP	Everything in All Features plus:	Everything in All Features plus:
*Receiver type	*Standard deviation	*Average horizontal precision
Correction status	*Horizontal Precision	*Worst horizontal precision
Date of collection	*#Elevation (MSL in feet)	*#Average vertical precision
Time of collection	*#Vertical Precision	*#Worst vertical precision
Data file name		
Total positions		
Filtered positions		

* Filled by GIS Department

Only necessary if elevation data is required by project